Giovanni News

From the Editor:

Hi again! It's April, which always seems like a good month to look forward. That's what we'll be doing in this month's issue, with a review of the development status of Giovanni-4, highlighting what's new and what's "in the pipeline" for capabilities that will be added in the upcoming months. Giovanni-4 is being tasked to do a lot of things; it's becoming a bridge technology for many different data access and data analysis processes. <u>We have determined that Giovanni-3 will be retired on August 31, 2015.</u>

We'll also mention a couple of new publications that have appeared since the beginning of the year, take a look at Typhoon Maysak, and have a new slogan. No fooling around here!

Jim Acker

The Giovanni News Editor

Selected Research Papers
January-March 2015

Roman, R., Bilbao, J., and de Miguel, A. (2015) Erythemal ultraviolet irradiation trends in the Iberian Peninsula from 1950 to 2011. *Atmospheric Chemistry and Physics*, **15**, 375–391, doi:10.5194/acp-15-375-2015.

Brody, S. and Lozier, M.S. (2015) Characterizing upper-ocean mixing and its effect on the spring phytoplankton bloom with in situ data. *ICES Journal of Marine Science*, doi: 10.1093/icesjms/fsv006.

VanReken, T.M., Mwaniki, G.R., Wallace, H.W., Pressley, S.N., Erickson, M.H., Jobson, B.T., and Lamb, B.K. (2015) Influence of air mass origin on aerosol properties at a remote Michigan forest site. *Atmospheric Environment*, **107**, 35-43, doi:10.1016/j.atmosenv.2015.02.027.

Yu, H., Chin, M., Yuan, T., Bian, H., Remer, L.A., Prospero, J.M., Omar, A., Winker, D., Yang, Y., Zhang, Y., Zhang, Z., and Zhao, C. (2015) The fertilizing role of African dust in the Amazon rainforest: A first multiyear assessment based on data from Cloud-Aerosol Lidar and Infrared Pathfinder satellite observations. *Geophysical Research Letters*, **42**, doi:10.1002/2015GL063040.
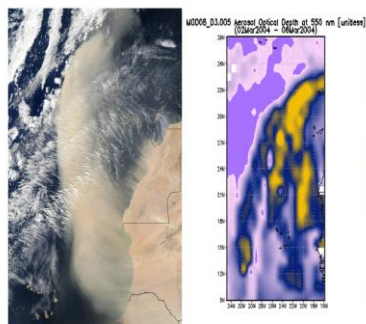
This Saharan dust storm image appears on the **@nasa_gesdisc** Twitter profile page.

HEAR YE! HEAR YE!

Here's what has been happening with Giovanni-4 in the past few months of development:

Release 4.10:
- *Map Smoothing:* A new plot option produces smoothed maps for Time averaged, User-Defined Climatology, Accumulation, and Correlation map services.
- *Histogram:* Giovanni computes a histogram of the values present in the given temporal and spatial selection.
- *Difference of Time-Averaged Maps:* Giovanni computes a time-average for each grid cell for two variables being compared and plots the differences between the values of the variables in the two maps.

Release 4.11:
- *Time-series of averages computed over shapes:* Computes area averages over shapes, such as countries or states, and plots the averages as time-series.
- *Map Animation interpolation and smoothing:* The visual appearance of the map animation has been improved through the use of GrADS.

Release 4.12
- *Time-averaged maps computed over shapes:* Computes time-averaged maps over shapes, such as countries or states.
- *Histogram computed over shapes:* Giovanni calculates histograms over shapes, such as countries or states.

Coming Soon:
- *Accumulation maps computed over shapes:* Giovanni computes maps of accumulated precipitation over shapes, such as countries or states.
- *Support for watershed (basin) shapes:* Calculates histograms, area-averaged time series, time-averaged maps, and accumulation maps over major watersheds.

New data in Giovanni-4:

- ✓ All of the data variables for the Ozone Monitoring Instrument (OMI) are now available in G4. This milestone represents the first migration of an entire data portal from Giovanni-3 to G4.
- ✓ G4 now hosts the Integrated Multi-satellitE Retrievals for GPM (IMERG) monthly and half-hourly data products.
- ✓ G4 now has data products from the North American Land Data Assimilation System (NLDAS) and Global Land Data Assimilation System (GLDAS).
- ✓ *Pending:* Data from the NASA Ocean Biogeochemical Model (NOBM) will be available soon in G4.

Not as Sunny in Florida as You Might Expect

(A Shapefile Analysis Demonstration)

In the Giovanni-4 developments described on the previous page, one particular service is quite prominent – the addition of shapefiles for many of the different analysis options. For those of you not familiar with the lingo associated with Geographic Information Systems (GIS), a "shapefile" relates to the shape of a geographic feature (e.g., region). A shapefile is a "geospatial vector data format" for GIS.

Rather than be concerned about the terminology, the most important aspect of a shapefile is what it represents: an area with geographic boundaries. This can be a city, a state, a national forest, a country, a drainage basin (also known as a watershed), or a geologic province. Right now, Giovanni-4 has shapefiles for U.S. state and country boundaries and is testing shapefiles for major watersheds.

To demonstrate the use of shapefiles, two data products were mapped with Giovanni-4, using a shapefile for the state of Florida: (1) Erythemal Daily Dose from OMI, which indicates exposure to ultraviolet radiation from the Sun that can cause biological damage (or as we know it, sunburn) and (2) daily precipitation from the Tropical Rainfall Measuring Mission (TRMM). The day chosen was June 22, 2005, when solar radiation would be expected to be quite intense in the Sunshine State of Florida. The Erythemal Daily Dose data are shown on the left, and the daily precipitation data are shown on the right.
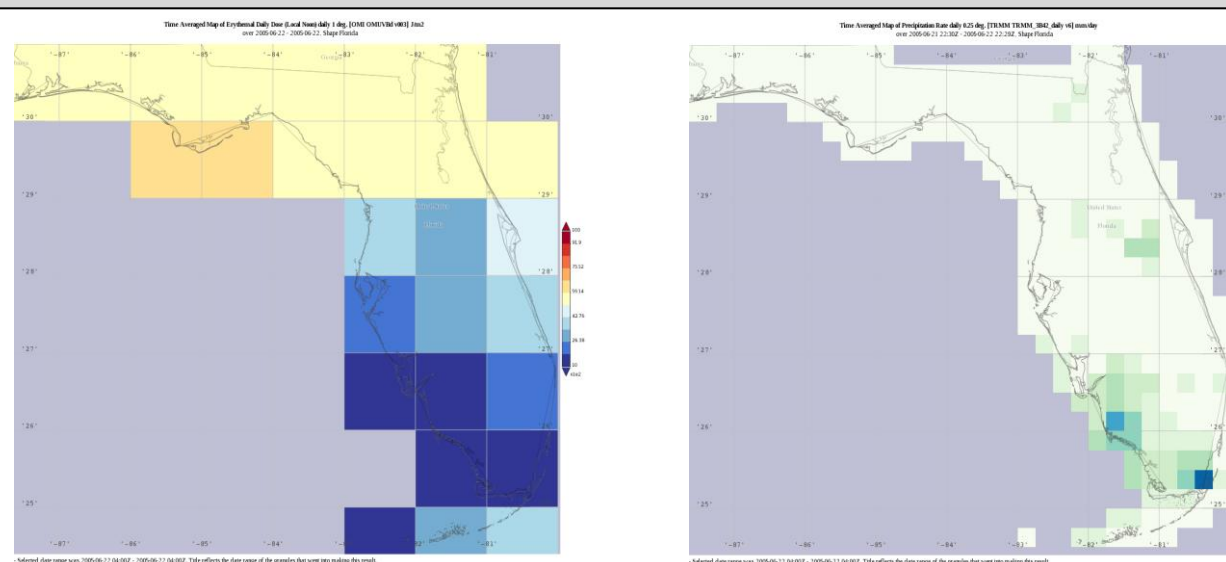

As you can see, it wasn't exactly sunny in southern Florida on June 22, 2005, and a person's chances of getting a sunburn were pretty low. For sun-seekers, northern Florida was the place to be on this day. The reason for the reduced sunshine can be seen in the precipitation map; there was a lot of rain that day over the southern peninsula, especially by Miami and the northern Florida Keys. Though the color scale is hard to see, that dark blue pixel over Miami represents about 140 mm (5 inches) of rain! (If you "zoom" in on this document, you can read the numbers on the color scales.)

Typhoon Maysak, March 31, 2015, 03Z

This image of Typhoon Maysak was generated with the Tropical Rainfall Measuring Mission (TRMM) Multi-Satellite Precipitation Analysis data product. Because the remarkable 17-year TRMM mission is ending, Maysak may be the final storm observed by the satellite's sensors. Data from the Global Precipitation Measurement (GPM) mission will continue to extend the long precipitation record provided by TRMM in Giovanni.

At the time of the image (right), Maysak was a powerful early-season storm with a prominent eye. The storm devastated the small Micronesian island of Ulithi (Yap) but fortunately weakened before landfall in the Philippines.

TRMM_3B42RT.007 precipitation [mm/hr]
(03:00Z31Mar2015)
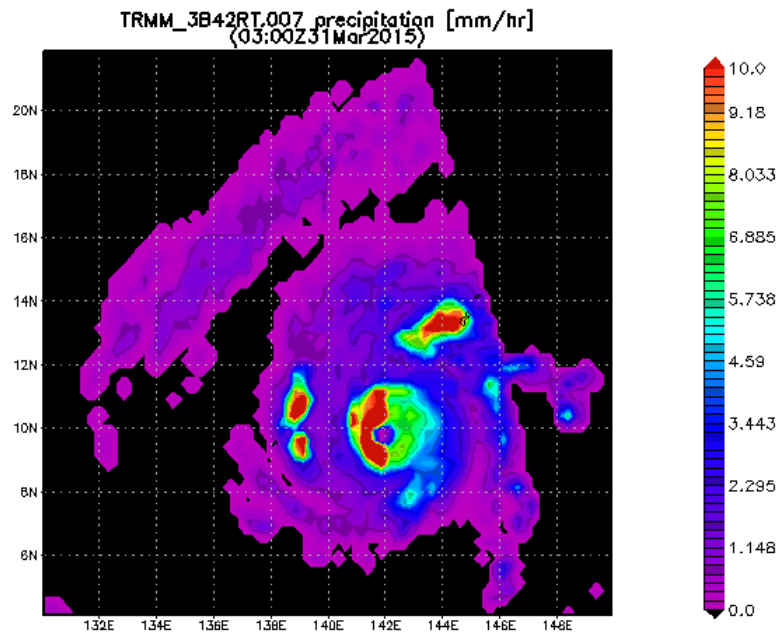
This image was created with Giovanni-3, which in a few months will be replaced by Giovanni-4!

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